Alternative Sugar Sources for Biobased Chemicals

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Stellingen

Behorende bij het proefschrift

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1. Sugar is the new oil.
2. The exact sugar content in the sugar fraction of pyrolytic liquid is difficult to determine as direct analytical techniques are absent.
3. The kinetic model for 5-HMF synthesis from glucose as developed by Chang *et al*. is unrealistic as it does not consider the consecutive reaction of 5-HMF to humins (Chang, C. Ma, X. and Cen, P., (2006). Chin. J. Chem. Eng., 14, 708-712).
4. The proposed reaction network for humins as proposed by Kruse *et al.* is not correct as it does not involve the direct conversion of sugars to humins (Jung, D., Zimmermann, M., Kruse, A., (2018). ACS Sustainable Chem. Eng., 6, 13877–13887).
5. Amberlyst 16 is preferred above sulfuric acid for the hydrolysis of levoglucosan to glucose (This thesis, Chapter 2 and 3).
6. The procedure used by Dogu *et al.* to calculate effective diffusion coefficients is scientifically not justified (Oktar, N., Mürtezaoğlu, K., Doğu, G., & Doğu, T. (1999). Can. J. Chem. Eng., 77(2), 406-412; Doğu, T. and Doğu, G., (1991). Chem. Eng. Comm., 103, 1-9).
7. Impurities in thick juice surprisingly have a positive impact on HMF selectivity and yield (this thesis, Chapter 5 and 6).
8. The experimental observation that HMF is formed from sucrose at basic conditions (this thesis, Chapter 6) is surprising when considering that HMF is not observed when using fructose as the feed (Kuster, B. F., & Temmink, H. M. (1977). Carbohydrate research, 54(2), 185-191; Körner, P., Jung, D., & Kruse, A. (2019). ChemistryOpen, 8(8), 1121-1132).
9. Caramel – a seemingly simple food ingredient, is in fact is a complex mixture of several thousand compounds formed by a large number of unselective reactions.
10. Performing experiments in the laboratory is like cooking and baking. All require precision, good temperature distribution and control, patience and experience to achieve best results.